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NOTES ON ARADIDAE IN THE U. S. NATIONAL MUSEUM  
(HEMIPTERA)

I. SUBFAMILY CALISIINAE

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Through the good offices of Dr. Reece I. Sailer and Dr. Carl J. Drake, I had the privilege to study the unidentified Aradidae in the collections of the U. S. National Museum in Washington, D. C., including the Drake Collection. I wish to express my thanks to them.

This paper, the first in a series, deals with the subfamily Calisiinae, which is surely one of the oldest, if not the oldest, among Aradidae.<sup>2</sup>

All species of Calisiinae, with the exception of *Aradacanthia multicalcarata* Costa, are very small—less than 4 mm. long—and difficult to collect. Consequently, our knowledge of their distribution and habits is far from complete; but fragmentary as this knowledge is, it indicates that Calisiinae are almost tropicopolitan, penetrating sometimes into temperate zones; i. e., *Calisius salicis* Horváth, 1913, was found in northern Yugoslavia and *Calisius annulicornis* Bergroth, 1913, in Tasmania. No species are known from tropical Asia, but *Calisius salicis* Horváth is recorded from Syria, and

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<sup>2</sup> In the division of Aradidae (or Aradoidea, as used by some modern European authors) I am following the American authors, considering them as one family, with five subfamilies: Calisiinae, Aradinae, Mezirinae, Isoderminae, and Aneurinae.

*Aradacanthia multicalcarata* Costa, 1864, from Indonesia. Matsuda and Usinger (1957) reported nine species of *Calisius* from Micronesia.

The most important characters separating Calisiinae from other subfamilies are the presence of tergum VIII in the males as well as the females; the scutellum covering most of the hemelytra, with correlated reduction of the corium and its venation; and the presence of a double row of tubercles or teeth on the outer margin of the abdomen.

Calisiinae includes only three genera: *Calisius* Stål, 1860, *Aradacanthia* Costa, 1864, and *Calisiopsis* Champion, 1898. The first genus had 33 species scattered all over the world, one of them fossil. The latter two were monotypic, *Aradacanthia* known from the Orient, and *Calisiopsis* from Central America.

In this paper are described six new species of the genus *Calisius* (four American and two Australian) and two new species of the genus *Calisiopsis* (one from southeastern Brazil and one from Mexico).

#### Key to the genera of the subfamily Calisiinae

1. Body very broad, abdomen almost discoidal; pronotum with each lateral border deeply emarginate in the middle, forming four (2+2) rounded and densely denticulated lobes; stridulatory mechanism present.

##### *Aradacanthia* Costa

Body elongately ovate or ovate, abdomen never discoidal; lateral borders of the pronotum at most slightly emarginate, or almost straight, without lobes; stridulatory mechanism absent. . . . . 2

2. Anterior process of the head more robust; antenna normal, generally with the segments increasing in length from the first to fourth; hypopygium of the males big, dorsocaudal or caudal in position, clearly visible from above.

##### *Calisius* Stål

Anterior process of the head relatively narrower and more protruding; the first three antennal segments very short, moniliform, the fourth as long, or almost as long, as the first three together, and granulated; hypopygium of the male flat, displaced on the ventral surface, and removed from the hind border, not visible from above. . . . . *Calisiopsis* Champion

As already mentioned, Calisiinae differs from other subfamilies by tergum VIII being present not only in the females, but also in the males.

In *Calisius* Stål, tergum VIII of the male is a transverse, short sclerite, placed behind and a little lower than tergum VII and before the hypopygium (fig. 1).

In *Calisiopsis* Champion, tergum VIII is produced posteriorly in a curious process having the form of an inverted gutter; its borders are almost closed posteriorly, thus forming a tube (fig. 2). This process serves as a sheath for the pointed tip of the male organ. The lateral parts of tergum VIII are bent on the ventral side of the abdomen posteriorly along the split of the process, resulting in the

displacement of the hypopygium toward the ventral surface well removed from the hind margin of the abdomen; sternum VIII is moved further forward, its lobes (genital lobes) are placed on each side of the flattened hypopygium as slender, long spurs projecting far beyond the hind border of the latter, but still not visible from above.

In *Aradacanthia* Costa, tergum VIII has the form of a small, subtriangular, apically rounded lobe, placed behind and slightly lower than tergum VII, and serves as a cover for the excavated upper surface of the hypopygium (fig. 3). The hypopygium is caudal in position, rather small in comparison with that of the genus *Calisius*, and subpyriform in shape. Sternum VIII is crescent-shaped; its lobes are big, flat, apically bilobate, and the spiracle is placed between the lobes so that the tip of the genital lobes looks tricuspitate. Antenna of *Aradacanthia* with the first two segments short, and apical two longer, proportions being 8:5:12:14; the fourth segment granulated as in *Calisiopsis*.

Calisiinae are very rare, many of the species known only from a single, or very few specimens; this has no doubt contributed to the lack of a clear understanding of the relationship of Calisiinae to the other subfamilies of Aradidae.

### Genus *Calisius* Stål, 1858

*Calisius* Stål, 1858, K. Vet. Akad. Handl., Stockholm, vol. 2, no. 7, pp. 1-84.

*Aradosyrtris* Costa, 1864, Ann. Mus. Zool. Univ. Napoli, vol. 2, p. 132.

Type of genus: *Calisius pallipes* Stål, 1858, by monotypy.

*Calisius* is represented in America by 13 species, of which four are here described. Distribution is tropical or subtropical; from Florida to northern Argentina (Tucumán).

#### *Calisius gracilis*, new species

FIGURES 4, 5

MALE: Head (fig. 4) shorter than wide through the eyes (35:38); anterior process (tylus and juga together) strong, parallel, anteriorly rounded, and without any notch, densely covered with erect, blunt tubercles; apex attaining the tip of the 3d antennal segment. Antenniferous spines short, dentiform, scarcely reaching the tip of the 1st antennal segment. Eyes semiglobose. Postocular spines each small, dentiform, slightly projecting beyond the outer margin of the eye. Infraocular carinae formed by a row of blunt, erect tubercles. Vertex with V-shaped row of blunt tubercles; the space between them covered with smaller granulation. Antenna short and slender; the 1st joint ovate, the 2d subglobular, the 3d tapering toward the base, the 4th fusiform; the proportions are (1 to 4): 6:3:8:10. Rostral groove

closed posteriorly, its borders low, granulated; rostrum reaching to the hind border of the groove.

Pronotum (fig. 4) trapezoidal, much shorter than wide across the humeri (28:68), declivous forward; interlobal, transverse depression feebly marked; fore border subtruncate; lateral margins divergent posteriorly, slightly emarginate in the middle, near the anterior angles provided with a row of 4-5 big, blunt, whitish tubercles, the middle ones largest; humeri convex, rounded, and provided with a double row of big, blunt tubercles; hind border convex in the middle and laterally. Fore disc with four (2 + 2) big, erect, blunt tubercles; hind disc with four (2 + 2) longitudinal rows of similar tubercles; these rows are continued on the base of the scutellum; the inner rows of the hind disc correspond to two rows of the fore disc, and are divergent posteriorly; the outer ones are curved, with the convex side outward. The discs between the tubercles are roughly punctured.

Scutellum big, much longer than wide (82:50), in the middle laterally, slightly emarginate; at the base with a high, triangular elevation, posteriorly continued into a median ridge; this elevation is provided with four (2 + 2) rows of big tubercles, forming a continuation of those of the pronotum; between the larger tubercles are scattered smaller granulae. The median ridge is gradually tapered to the tip and is provided with a row of thin, erect teeth; similar rows of thin, erect teeth are on the lateral margins, forming a palisade on either side; the disc between the margins and median carina is roughly punctured, but without granulation.

Hemelytra mostly concealed beneath the scutellum, each with only the narrow, outer edge of the greatly reduced corium exposed.

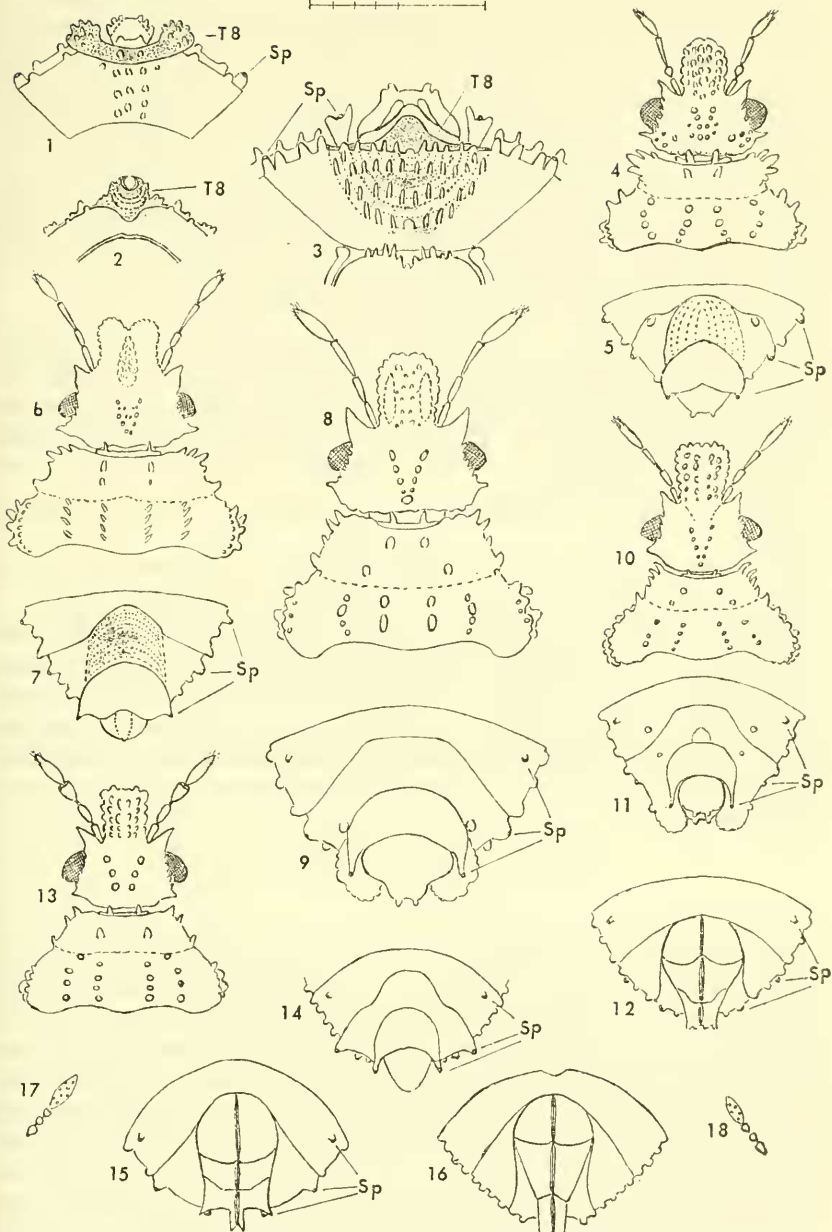
Abdomen ovate, slightly longer than wide (80:78), as measured from below. Connexivum very wide; each segment with a round, callous

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#### FURTHER EXPLANATION OF FIGURES 1-18

- 1-3, Tip of abdomen, dorsal aspect, male: 1, *Calisius insignis*, new species; 2, *Calisiopsis ampliceps* Champion; 3, *Aradacanthia multicalcarata* Costa.  
4, 5, *Calisius gracilis*, new species, male: 4, head and pronotum; 5, tip of abdomen, ventral aspect.  
6, 7, *C. bilobatus*, new species, male: 6, head and pronotum; 7, tip of abdomen, ventral aspect.  
8, 9, *C. insignis*, new species, male: 8, head and pronotum; 9, tip of abdomen, ventral aspect.  
10-12, *C. longiventris*, new species: 10, male, head and pronotum; 11, male, tip of abdomen, ventral aspect; 12, female, tip of abdomen, ventral aspect.  
13, 14, *C. hackeri*, new species, male: 13, head and pronotum; 14, tip of abdomen, ventral aspect.  
15, *C. australis*, new species, female, tip of abdomen, ventral aspect.  
16, *Calisiopsis minutus*, new species, female, tip of abdomen, ventral aspect.  
17, 18, Antenna of female: 17, *Calisiopsis ampliceps* Champion; 18, *C. minutus*, new species.

0 .25 .5 1mm



FIGURES 1-18.—Head, pronotum, tip of abdomen, and antenna of various species of *Calisius*, *Aradacanthia*, and *Calisiopsis*. Key to symbols: T8, tergum VIII; Sp, spiracle. Further explanation on facing page.



spot, surrounded by scattered granulations; the disc of tergum VII elevated, and transversally depressed in the middle, almost saddle-shaped; the exterior borders of the abdomen with two (dorsolateral and ventrolateral) rows of big, blunt, semierect tubercles. Venter rather smooth, with fine and dense punctation, but without granulation. Sternum VII longitudinally inflated (fig. 5). Spiracles II-V ventral, progressively nearer the margin, those of VI lateral, of VII almost dorsal, both placed at the apex of a tubercle. Hypopygium caudal in position, not very big, provided with a median sulcus, and with two (1 + 1) rows of granulae at the upper end of the sulcus.

Legs finely granulated, unarmed.

Color: Orange-yellow; scutellum testaceous, with two subbasal, lateral spots, and subapical, transverse band, whitish. Connexivum yellow, its outer border bicolored with alternating testaceous and whitish on each segment. Granulation, with rare exceptions, more pale than the background.

Size: Total length 2.83 mm.; width of pronotum 1.10 mm.; width of abdomen 1.27 mm.

HOLOTYPE: Male (USNM 64204); Livingston, Guatemala, Nov. 5, Barber and Schwarz.

REMARKS: *Calisius gracilis*, new species, is somewhat allied to *confusus* Kormilev, 1953, but is smaller; the head is wider than long; antennae shorter and with different proportions; and granulation of the pronotum and scutellum more pronounced. It is allied also to *affinis* Barber, 1954, but has different proportions of the antennal segments, a granulated median carina of the scutellum, and different coloration.

*Calisius bilobatus*, new species

FIGURES 6, 7

MALE: Head (fig. 6) slightly shorter than wide through the eyes (40:42); anterior process reaching the tip of the 3d antennal segment, slightly widening forward, with the tip distinctly notched and rounded laterally, so that it looks bilobate; the antenniferous spines are dentiform, but wider at the base, not so slender as in the preceding species; the postocular spines rather robust and distinctly protruding beyond the outer margin of the eyes; the proportions of the antennal segments (1-4) are 7:5:10:13.

Pronotum much shorter than wide across the humeri (30:75); the spiculoid, erect tubercles of the pronotum are fine and high.

Scutellum much longer than wide (95:55); the fine, erect teeth of the median carina and the borders are particularly long and dense.

Abdomen longer than wide (95:85), as measured from below, more tapered posteriorly than in *gracilis*; the outer rows of tubercles on

the connexivum are stouter and shorter than in other species. Spiracles of segments II-V ventral, those of VI and VII lateral and visible from above. Sternum VII longitudinally inflated (fig. 7). Hypopygium rather large, caudal in position.

Color: Ochre-yellow, mottled with brown and whitish; scutellum with brown spots around the subbasal lateral whitish spots, at the middle of the lateral margins and on the tip; connexivum bicolorous with brown and white lateral granulation.

Size: Total length 3.33 mm.; width of pronotum 1.23 mm.; width of abdomen 1.40 mm.

HOLOTYPE: Male (USNM 64205), Bolivia, W. M. Mann, Biological Expedition, 1921-1922.

REMARKS: *Calisius bilobatus*, new species, is also somewhat allied to *confusus* Kormilev, 1953, but differs from it by the bilobate anterior process of the head, different proportions of the antennal segments, and finer and longer granulation of the pronotum and scutellum.

*Calisius insignis*, new species

FIGURES 8, 9

MALE: Head (fig. 8) as long as wide through the eyes (24:24), anterior process big, parallel, anteriorly rounded, laterally impressed, roughly granulated, attaining the middle of the 3d antennal segment; antenniferous spines stout, dentiform, divaricating and directed slightly downward, almost reaching tip of the first antennal segment; eyes subconical; postocular spines small, tuberculiform, each attaining the outer margin of the eye. The infraocular carinae formed by a few, blunt granules. Vertex with V-shaped, rough granulation; between the latter and infraocular carinae, depressed and with a finer, scale-shaped granulation. Antenna slender, segments with proportions (1 to 4) of 4:5:6:8; the 1st segment subcylindrical, the 2d and 3d tapering toward the base, the 3d slightly narrower than the 2d, the 4th fusiform. Rostrum not attaining the hind border of the groove.

Pronotum less than half as long as wide across the humeri (20:43); anterior border truncate; lateral borders convergent, in the middle slightly emarginate; anteriorly with a single but at the humeri with a triple row of big, blunt teeth. Fore disc with two (1+1) posteriorly divergent rows of big, erect teeth (each row contains three widely separated teeth). Hind disc with four (2+2) short, parallel rows of similar teeth (the inner rows with two, the outer with four, closely placed teeth); fine, scale-shaped granulation dispersed between the teeth.

Scutellum much longer than wide (62:35), slightly constricted near middle. The basal triangular elevation short, with six (3+3) big,

blunt tubercles placed in two rows: four in the basal row and two in the apical row; dispersed, fine, scale-shaped granulation between these tubercles. Median carina stout, granulated; the lateral borders also granulated, granulae are the highest in the middle and gradually lower toward the base and the tip. Disc of the scutellum roughly punctured.

Abdomen (fig. 9) elongately ovate, longer than wide (80:52); lateral margin parallel, anteriorly and posteriorly roundly converging. The discs of the connexiva with scale-shaped, fine granulation. The disc of tergum VII longitudinally elevated, and with bigger granulation. Sternum VII laterally produced backward as two (1+1) big, rounded, granulated lobes, similar to *affinis* Barber, 1954. The genital lobes small, cylindrical, placed beneath the big lobes, and not visible from above. Spiracles II-VI ventral, placed progressively closer to the border, those of VII lateral, situated on tubercles, those of the lobes (VIII) terminal. Venter covered with fine scale-shaped granulation; propleura with a group of larger granulations.

Color: Pale testaceous; the fore half of the head, antennae, the apical third of the scutellum, and the scale-shaped granulation of the connexivum more pale, sometimes whitish.

Size: Total length 4.27 mm.; width of pronotum 1.42 mm.; width of abdomen 1.73 mm.

HOLOTYPE: Male (USNM 64206), Livingston, Guatemala, July 5, H. S. Barber.

REMARKS: *Calisius insignis*, new species, is allied to *contubernalis* Bergroth, 1913, from which it differs in having antennae slightly shorter than the head (23:24). Second segment slightly shorter than the first (5:4) and failing to reach the tip of the anterior process; hypopygium on the underside without longitudinal depressions, but with two (1+1) medially convergent rows of granulae. Also it is allied to *affinis* Barber, 1954, in having similar big, rounded, posteriorly protruding lobes on sternum VII, but *insignis* is larger, has the margins of the scutellum denticulate, and differently proportioned antennal segments.

*Calisius longiventris*, new species

FIGURES 10-12

MALE: Head (fig. 10) almost as long as wide through the eyes (41:40). Anterior process parallel, anteriorly rounded, reaching to the tip of the 3d antennal segment. Antenniferous tubercles dentiform, exteriorly parallel, each reaching to the tip of the first antennal segment. Eyes small. Postocular tubercles small, dentiform, each attaining the outer margin of the eye. Infraocular carinae formed by a few tubercles; shelves (space between the middle of the vertex



and infraocular carinae) slightly longitudinally depressed. Vertex with V-shaped row of tubercles. Antennae slender; with proportions of the antennal segments (1 to 4) 6:6:7:13. Rostrum reaching the hind border of the rostral groove.

Pronotum much shorter than wide (27:67). Fore disc with four (2+2) tubercles forming two, slightly divergent backward rows, which are continued on the hind lobe (outer rows). Hind lobe with four rows of tubercles; the outer rows consist of three tubercles each, the inner ones of four smaller tubercles; all four rows are strongly divergent posteriorly.

Scutellum very long (103:57); the basal triangular elevation provided with six (3+3) bigger and a few smaller tubercles; median carina finely granulated; margins of the scutellum each with a row of small, erect teeth, running to two-thirds of their length, then without teeth. Disc roughly punctured, and with a few dispersed, erect tubercles.

Abdomen (figs. 11, 12) very long (100:81); each connexivum with two brown tubercles and 1 yellow tubercle (upper row). Tergum VII longitudinally inflated in the middle; sternum VII with two (1+1) big, rounded lobes, protruding far beyond the tip of the hypopygium; genital lobes (of sternum VIII) shorter than the hypopygium and not visible from above. Hypopygium small, posteriorly granulated. Spiracles of segments II-VI ventral, those of VII lateral and visible from above. Venter finely granulated.

Color: Ochre-yellow, mottled with brown; scutellum whitish; basal triangle, the tip (narrowly), and some irregular spots on the disc brown; lateral borders in the middle piceous; ventral surface of the body with carmine punctures and spots.

FEMALE: Sexual dimorphism is rather pronounced, the female having a much shorter and more ovate abdomen, without big rounded lobes on sternum VII, and with only segment IX protruding posteriorly. Proportions: head 38:40; pronotum 32:70; scutellum 100:55; abdomen 100:86; antennal segments (1 to 4) 6:7½:7½:13.

SIZE: Total length of male and of female, 3.47 mm. Width of pronotum: male, 1.12 mm.; female, 1.17 mm. Width of abdomen: male, 1.35 mm.; female, 1.43 mm.

HOLOTYPE: Male (USNM 64207), Paraiso, Canal Zone, Panama, Jan. 23, 1911, E. A. Schwarz.

ALLOTYPE: Female, same data as holotype.

PARATYPES: 14 paratypes, same data as holotype, deposited in the U. S. National Museum and in the collection of the author.

REMARKS: *Calisius longiventris*, new species, is allied to *affinis* Barber, 1954, but is lighter in color; the body of the male, particularly the abdomen, is much longer and posteriorly more narrowed; and the

rounded lobes of sternum VII are bigger and more protruding posteriorly. From *insignis*, new species, to which it is also allied, *longiventris* differs in its smaller size, different proportions of the antennal segments, and having the basal two-thirds of lateral margins of the scutellum denticulated.

*Calisius australis*, new species

FIGURE 15

FEMALE: Head as long as wide through the eyes (18:18); anterior process almost ovate, anteriorly rounded, at the base slightly constricted, roughly granulated, reaching to the tip of the 3d antennal segment; antenniferous spines acute, strongly divaricate, scarcely reaching the tip of the first segment; eyes big, semiovate, protruding; postocular spines small, tuberculiform, not reaching the outer margins of the eyes; infraocular carinae each formed by three erect tubercles. Vertex flat, with V-shaped row of granules. Antennae slender, the first segment subcylindrical, the 2d ovate, the 3d slightly tapering toward the base, the 4th fusiform; proportions of the antennal segments (1 to 4) 3:3½:4:7½. Rostrum slightly shorter than the rostral groove.

Pronotum much shorter than wide across the humeri (19:34); anteriorly truncate; collum well marked and provided with two (1+1) big, erect tubercles; lateral margins converging anteriorly slightly constricted medially. Fore disc with two (1+1) erect tubercles, followed by four (2+2) divergent rows of similar tubercles, continued on the hind disc. Lateral margins of the fore lobe each with three big, blunt teeth. Hind lobe inflated and coarsely punctured; disc with four (2+2) rows of erect tubercles; the inner rows are subparallel, the outer ones curved; humeri each with a double row of similar tubercles.

Scutellum longer than wide at the base (47:27); the basal triangular elevation very high; middle of base provided with a transverse, curved row of four depressed tubercles, and the disc with four additional very big tubercles, of which the inner ones are semideflated, the outer ones erect. The median ridge with a row of dense, erect tubercles. The lateral margins with a row of erect teeth along the basal half; at the tip of the scutellum are placed two (1+1) small tubercles. The disc is roughly punctured.

Abdomen elongately ovate (59:40), with the connexivum obliquely raised; the lateral borders with a double row of smaller, rather obliterated tubercles, more obliterated in the dorsolateral than in the ventrolateral row. Spiracles of segments II-VI ventral, placed far from the lateral margin, those of VII dorsolateral, each placed on the apex of a tubercle; those of the genital lobes (VIII) terminal. Lobes of segment VIII granulated, divergent, reaching the middle of IX, the latter slightly

emarginate at the tip. Venter roughly punctured and with a few dispersed tubercles.

Color: Pale yellow-brown; antennae pale yellowish, segment iv pale testaceous; tubercles on the hind disc of the pronotum testaceous; scutellum testaceous, with a whitish band in the shape of two hooks forming an inverted V. Connexivum yellow; segment ii (the first visible) entirely testaceous, segments iii-v testaceous at the anterior half of the exterior border, and segments vi and vii entirely testaceous; segment viii whitish. Ventral surface orange-yellow; pleurae and the tip of the venter testaceous; the disc of the venter whitish.

HOLOTYPE: Female, Brookfield, Australia, Oct. 20, 1928, H. Hacker; deposited in Drake Collection, U. S. National Museum.

ALLOTYPE: Male, Southport, Australia, Jan. 26, 1929, H. Hacker; deposited in Drake Collection, U. S. National Museum.

REMARKS: *Calisius australis*, new species, is allied to *annulicornis* Bergroth, 1913, but is smaller, color of the body is paler, and proportions of the antennal segments are different.

*Calisius hackeri*, new species

FIGURES 13, 14

*Calisius hackeri*, new species, is so closely allied to *australis*, new species, that I first believed it to be the opposite sex of the latter. After closer examination, I found distinctive characters, which allowed the two to be distinguished as separate species.

The antenna of *hackeri* is relatively shorter, the ratio between the length of the antennae and width of the head through the eyes being 38:34, as compared to only 38:37 in *australis*.

The 4th segment of the antennae is distinctly shorter than the 2d and 3d together (12:15), whereas in *C. australis* the same ratio is 15:15.

The 2d and 3d antennal segments are ovate and wider than the first, while in *australis* they are of the same width and taper towards the base, subconically.

The postocular spines are relatively shorter, and definitely fail to reach the outer margin of the eyes; the inner rows of the tubercles on the hind lobe of the pronotum have relatively smaller tubercles, five in each row, while in *australis* they are larger and only four in each row.

Tubercles on the basal triangular elevation of the scutellum are not depressed, the two inner ones in the basal row are very low and smaller than the outer ones, while in *australis* the inner tubercles are the larger and all are depressed. The apical margin of the scutellum has six small tubercles (3+3), decreasing in size from the inner to the outer ones, whereas there are only two (1+1) very small tubercles similarly located on *australis*; both rows of the tubercles (dorsolateral and ventrolateral) on the outer borders of the abdomen are well pro-

nounced, while in *australis* they are mostly obliterated in the dorso-lateral row, being more pronounced only at the base and at the tip of the abdomen.

The color of *hackeri* is slightly darker than that of *australis*, but the pattern of the scutellum is the same.

In *hackeri* the spiracles of segments II-VI are ventral, while those of segment VII are dorsolateral.

All other characters agree with *australis*.

Proportions of *hackeri*, male, are as follows: head 38:38; antennae 7:8:7:12; pronotum 35:65; scutellum 50:85; abdomen 81:75.

SIZE: Total length 3.0 mm.; width of pronotum 1.07 mm.; width of abdomen 1.23 mm.

HOLOTYPE: Male, Southport, Queensland, Australia, H. Hacker, Jan. 26, 1929; deposited in the Drake Collection in the U. S. National Museum.

REMARKS: This species is dedicated to Mr. H. Hacker, an Australian entomologist who collected this as well as many other curious species of Australian Aradidae.

### Genus *Calisiopsis* Champion, 1898

*Calisiopsis* Champion, 1898, in Godman and Salvin, *Biologia Centrali-Americana*, vol. 2, p. 67.

Type of genus: *Calisiopsis ampliceps* Champion, 1898.

This genus was monobasic, with a single species, *Calisiopsis ampliceps* Champion, 1898, described from Panama, though Champion indicated that one of his three specimens, without head, probably belonged to another species.

In 1951 I received one specimen of *Calisiopsis* from the Rev. Pio Buck, S. J., professor of the Colegio Anchieta, Porto Alegre, Rio Grande do Sul, Brazil, and, somewhat later, I received some additional specimens from Mr. Plaumann, Nova Teutonia, Santa Catarina, Brazil. Although it was difficult to understand how a species with such limited power of flight could be distributed in Central America and southeastern Brazil, Champion's description fits my specimens and I identified them as *Calisiopsis ampliceps* Champion. As the male of *Calisiopsis* was unknown, I described it (Kormilev, 1956, p. 149).

Among Aradidae from the U. S. National Museum I have now seen four specimens of *Calisiopsis* from Mexico. Two of them fit Champion's description and drawings and two do not, but they all are clearly different from the Brazilian specimens. As a result we have now three different species. Assuming that the specimens from Tomazunchale, which fit the Champion's description and drawings,



are *Calisiopsis ampliceps* Champion, 1898, the other two species are here described as new.

***Calisiopsis ampliceps* Champion, 1898**

FIGURE 17

*Calisiopsis ampliceps* Champion, 1898, in Godman and Salvin, *Biologia Centrali-Americana*, vol. 2, p. 67, pl. 5, figs. 4, 4a, 4b.

Heretofore known only from the female.

MALE: Head shorter than wide through the eyes (33:47); anterior process scarcely longer than wide at the base (18:17); the proportions of the antennal segments (1 to 4) are 5:3:3:13, the 4th segment being longer than the three preceding segments together. Seen from the front, only one-third of the eye is above the level of the vertex. Pronotum very short (35:78); scutellum much longer than wide at the base (101:67); abdomen longer than wide (110:92).

Size: Total length 3.23 mm.; width of pronotum 1.23 mm.; width of abdomen 1.53 mm.

SPECIMEN EXAMINED: Allotype male, Tomazunchale, Mexico, Apr. 3, 1946, on orchid plants; in the U. S. National Museum.

***Calisiopsis minutus*, new species**

FIGURE 18

FEMALE: Similar to *Calisiopsis ampliceps* Champion, 1898, but distinctly smaller and more yellowish; scutellum more whitish, the four (2 + 2) white spots fused together; the few scattered big granules on the disc of the scutellum are almost obliterated; eyes relatively smaller; the infraocular shelves less depressed; but the main difference is in the 4th antennal segment, which is slightly shorter than the three preceding antennal segments together (10:11), the proportions of the segments (1 to 4) being: 5:3:3:10. (See figs. 16, 17 and 18.) Other proportions are: head 35:43; pronotum 30:61; scutellum 80:57; abdomen 83:80.

Color: Yellow, with a fine whitish incrustation; eyes brown; some of the tubercles on the pronotum and five small tubercles in the middle of the lateral borders of the scutellum piceous; the basal triangle and tip of the scutellum, and two or three tubercles of each connexivum, pale brown.

Size: Total length 2.93 mm.; width of pronotum 1.02 mm.; width of abdomen 1.33 mm.

HOLOTYPE: Female (USNM 64208), Tampico, Mexico, December 28, E. A. Schwarz.

PARATYPE: Female, same data as holotype, in collection of the author.



*Calisiopsis brasiliensis*, new species

*Calisiopsis ampliceps* Kormilev (not Champion), Anal. Soc. Cient. Argentina, vol. 162, nos. 5, 6, p. 149, figs. 1-3.

Since the detailed description of the male was given in my previous paper (Kormilev, 1956, p. 149), I repeat here only the comparative ratios.

MALE: Head shorter than wide through the eyes (male 17:24; female 16:25.5); anterior process relatively longer and narrower (20:13); the proportions of antennal segments (1 to 4) are: male 3:5:4:19; female 3:5:3:18; pronotum shorter than wide across the humeri (male 19:38; female 19:41); scutellum longer than wide at the base (male 49:33; female 51:36); abdomen shorter than wide (male 43:46; female 44:50).

SIZE: Total length: male, 3.00 mm., female, 3.34 mm. Width of pronotum: male, 1.24 mm.; female, 1.37 mm. Width of abdomen: male, 1.50 mm.; female, 1.67 mm.

HOLOTYPE: Male, Nova Teutonia, Santa Catarina, Brazil, Dec. 8, 1940, F. Plaumann; deposited in the collection of the author.

ALLOTYPE: Female, locality and collector same as for holotype, collected Dec. 1, 1940; in the collection of the author.

PARATYPES: One male and one female, locality and collector same as for holotype; one female, Porto Alegre, Rio Grande do Sul, Brazil, Rev. P. Buck, S. J.

REMARKS: *Calisiopsis brasiliensis*, new species, differs from *C. ampliceps* Champion, 1898, principally in having a more robust and relatively wider body; relatively larger eyes that are placed much higher (seen from the front, two-thirds above the level of the vertex); and different proportions of the antennal segments.

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